



CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005



Job No.: CTCE/BBMP/W.No.13/GNR/WMM/Gradation/2015-16

10.02.2016

GRADATION FOR WMM MORTH TABLE-400-11



Customer : Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.

Agency : Mr. G.N. Ramesh,
No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.

Name of Work : Improvements and Asphaltting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.

Reference : EE/DD/WO/369/2014-15 Datd: 31.03.2015

Date of Testing : 10.02.2016

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): 7820

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	275	275	3.5	96.5	95-100
22.4	2635	2910	37.2	62.8	60-80
11.2	1615	4525	57.9	42.1	40-60
4.75	860	5385	68.9	31.1	25-40
2.36	975	6360	81.3	18.7	15-30
0.600	590	6950	88.9	11.1	8-22
0.075	545	7495	95.8	4.2	0-8



Note:

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ನಹಾಯ್ತು ಕಾರ್ಯದಾಯಕ ಅಭಿಯಾನರು
ಶಿಕ್ಷಕರು ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ಪಾಲಿಕೆ
ಬೃಹತ್ ಬೆಂಗಳೂರು ಮಹಾನಗರ ಪಾಲಿಕೆ
ಎಸ್.ಎಂ.ರಸ್ತೆ, ರವಿವಂದನಗರ, ಬೆಂಗಳೂರು

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Job No.: CTCE/BBMP/W.No.13/GNR/BC/AIV/2015-16

16.03.2016

Aggregate Impact Value

IS: 2386 Part IV

Client	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
Agency	Mr. G.N. Ramesh, No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphaltting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.03.2016



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	376	379	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	76	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines			
	$100 * (W_2/W_1)$ percent	20.21	20.84	20.53

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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ಶೆಟ್ಟಿಹಳ್ಳಿ ಉಪವಿಭಾಗ, ದಾಸರಹಳ್ಳಿ ಪಲಯ
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ಎಸ್.ಎಂ ರಸ್ತೆ, ರವೀಂದ್ರನಗರ, ಬೆಂಗಳೂರು

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Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	16.03.2016



Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	377	380	
2	Weight of aggregate passing 2.36 mm sieve after the test = W_2 g	77	80	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	300	
4	Aggregate Impact value = percent fines	20.42	21.05	20.74
	$100 * (W_2/W_1)$ percent			

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 24%

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JobNo: CTCE/BBMP/W.No.13/GNR/BC/Gradation/2015-16

18.03.2016

BITUMEN GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

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CLIENT	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
AGENCY	Mr. G.N. Ramesh, No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
NAME OF THE WORK	Improvements and Asphaltting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
REFERENCE	EE/DD/WO/369/2014-15 Datd: 31.03.2015
SAMPLE I/D	Roads in SAnthoshnagara, Ward No. 13
DATE OF TESTING	18.03.2016



GRADATION AFTER EXTRACTION

Sieve Size in mm	Trail 1				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	42.16	8.90	8.90	91.10	79-100
9.5	36.25	7.66	16.56	83.44	70-88
4.75	73.18	15.46	32.01	67.99	53-71
2.36	66.32	14.01	46.02	53.98	42-58
1.18	51.48	10.87	56.89	43.11	34-48
0.6	63.47	13.40	70.30	29.70	26-38
0.3	46.85	9.89	80.19	19.81	18-28
0.15	32.21	6.80	86.99	13.01	12-20
0.075	35.29	7.45	94.45	5.55	4-10

Sieve Size in mm	Trail 2				Specified Limits as per MORTH specification table 500-18 (Grading-2)
	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	
19	0	0	0	100	100
13.2	35.26	7.45	7.45	92.55	79-100
9.5	45.87	9.70	17.15	82.85	70-88
4.75	72.15	15.25	32.41	67.59	53-71
2.36	62.35	13.18	45.59	54.41	42-58
1.18	74.15	15.68	61.26	38.74	34-48
0.6	43.26	9.15	70.41	29.59	26-38
0.3	35.98	7.61	78.02	21.98	18-28
0.15	42.12	8.90	86.92	13.08	12-20
0.075	32.13	6.79	93.71	6.29	4-10

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Job No.: CTCE/BBMP/W.No.13/GNR/BC/Agg/2015-16

18.03.2016

Aggregate Gradation Test

IS : 2386 Part I

Client	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
Agency	Mr. G.N. Ramesh, No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	Improvements and Asphaltting of Santhoshnagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	EE/DD/WO/369/2014-15 Datd: 31.03.2015
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	18.03.2016



Total Weight of Sample: 5450 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade II specification as per MORTH
13.2	542	9.94	9.94	90.06	79 - 100	
9.5	556	10.20	20.15	79.85	70 - 88	
4.75	724	13.28	33.43	66.57	53 - 71	
2.36	635	11.65	45.08	54.92	42 - 58	
1.18	615	11.28	56.37	43.63	34 - 48	
0.600	690	12.66	69.03	30.97	26 - 38	
0.300	613	11.25	80.28	19.72	18 - 28	
0.150	289	5.30	85.58	14.42	12 - 20	
0.075	415	7.61	93.19	6.81	4 - 10	

Total Weight of Sample: 4800 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	JOBMIX Gradation as per MORTH	Remarks
19	0	0	0	100	100	Gradation satisfies Bituminous concrete Grade II specification as per MORTH
13.2	625	13.02	13.02	86.98	79 - 100	
9.5	469	9.77	22.79	77.21	70 - 88	
4.75	637	13.27	36.06	63.94	53 - 71	
2.36	505	10.52	46.58	53.42	42 - 58	
1.18	645	13.44	60.02	39.98	34 - 48	
0.600	516	10.75	70.77	29.23	26 - 38	
0.300	395	8.23	79.00	21.00	18 - 28	
0.150	406	8.46	87.46	12.54	12 - 20	
0.075	315	6.56	94.02	5.98	4 - 10	

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ಇದೇ ರೀತಿಯಲ್ಲಿ ಇತರ ಯಂತ್ರಗಳಿಂದ
ಪರೀಕ್ಷಿಸಿದಾಗ, ದಾಖಲೆಗಳು
ಪರೀಕ್ಷಿಸಿದಾಗ, ದಾಖಲೆಗಳು
ಪರೀಕ್ಷಿಸಿದಾಗ, ದಾಖಲೆಗಳು
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Job No.: CTCE/BBMP/W.No.13/GNR/BC/Stability/2015-16

18.03.2016

TEST REPORT ON STABILITY OF MIX

Client	:	Asst. Executive Engineer, Shettyhalli Sub Division, BBMP, Bangalore.
Agency	:	Mr. G.N. Ramesh, No. 01, 3rd Main, Gandhi Grama, 7th Cross, Maruthi Layout, Bangalore - 560021.
Name of the Work	:	Improvements and Asphaltting of Santhoslinagara roads in Ward No. 13 in Shettyhalli Sub Division, BBMP, Bangalore.
Reference	:	EE/DD/VO/369/2014-15 Dated: 31.03.2015
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Bituminous Concrete
Date of Testing	:	18.03.2016



The results of the tests conducted on the Bituminous Concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-19)
1	Marshal Stability, Kn	10.70	10.25	9 Kn (min)
2	Marshal flow, mm	3.15	2.20	2 - 4
3	Percent air voids in Mineral Aggregate	13.50	14.15	13 - 15
4	Voids in Compacted Mix	5.25	4.30	3 - 6
5	Percent Voids filled with Bitumen	69.80	70.25	65 - 75
6	Density, g/cc	2.26	2.27	--

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ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಅಭಿಯಂತರರು
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